SINYAKOV, V.I.

29

Collomorphous aggregates of zincite formed from a gaseous phase. V. I. Sinyakov, ~~Zapiski Vsesoyuz. Mineral. Obshchestva 86, 611-14(1957)~~.—Typical "collomorphic" reniform or multilayer-rhythmic, highly fine-cryst. aggregates are commonly described as being formed by pptn. reactions from aq. solns. Absolutely identical aggregations, however, may also occur from heterogeneous gas reactions, with volatile reagents. S. describes the volatilization of zinc in the waste gases of a blast furnace from which, in the upper zones zincite is deposited at temps. of the gases below 800° and down to 300°, in fine-cryst. wall deposits of typical "collomorphous" structures. 'Parallel to the gas current the ZnO is arranged in elongated aggregates which, however, in a cross section show a beautifully developed concentric-rhythmic festoon-like layer structure. The polished and etched sections (etched with concd. HCl for 1 min.) show the marks of "collomorphic" deposition. The analysis shows 78-88% ZnO, 1.1-1.2% Zn, and other accessories (chiefly coke fragments, magnetite), among which FeO may reach 7%. Hardness 4 to 4.5; d. 4.7. The reflection power of the zincite is somewhat lower than that of magnetite. The x-ray diagram is identical with zincite from Franklin Furnace, N.J. Analogous "collomorphic" zincite ores are not known in nature. W. Eitel

Siberian Metallurgical Inst.

SINYAKOV, V.I.

Angular unconformity in Ordovician deposits of Gornaya Shoriya.
Izv. Sib. otd. AN SSSR no.5:19-25 '58. (MIRA 11:9)

1.Sibirskiy metallurgicheskiy institut.
(Gornaya Shoriya--Geology)

SINYAKOV, V.I.

Geology and mineral composition of ores of the Lespromkhoz deposit in Gornaya Shoriya. Geol.rud.mestorozh. no.4:37-53 Jl-Ag '61. (MIRA 14:10)

1. Sibirskiy metallurgicheskiy institut, Stalinsk.
(Gornaya Shoriya—Ore deposits)

SINYAKOV, V.I.; CHICHKOVA, T.A.

Large plate of native copper from Gornaya Shoriya. Zap.Vses.min. ob-va 90 no.3:282-283 '61. (MIRA 14:10)

1. Sibirskiy metallurgicheskiy institut i Geologicheskiy muzey Zapadno-Sibirskogo geologicheskogo upravleniya.
(Gornaya Shoriya--Copper ores)

SINYAKOV, V.I.; SINYAKOVA, N.M.

Monticellitite skarns in Gornaya Shoriya. Zap.Vses.min.ob-va 90 no.6:720-727 '61. (MIRA 15:2)

1. Sibirskiy metallurgicheskiy institut, Novokuznetsk.
(Gornaya Shoriya--Skarns)

SINYAKOV, V.I.; FEDYANINA, Ye.S.

Lower Ordovician sediments in the Kaz iron-ore deposit of Gornaya Shoriya. Mat.po geol.Zap.Sib. no.63:41-55 '62. (MIRA 16:10)

SINYAKOV, V. I.

Brucite from Gornaya Shoriya. Zap. Vses. min. ob-va 91 no.3: 358-360 '62. (MIRA 15:10)

1. Sibirskiy metallurghicheskiy institut.

(Gornaya Shoriya—Brucite)

SINYAKOV, V.I.; NOVOZHILOV, V.I.

Comparative study of the microhardness of galenites from complex metal deposits in the Altai, eastern Transbaikalia, and the Maritime Territory. Geol. i geofiz. no.10:169-171 '64. (MIRA 18:4)

1. Institut geologii i geofiziki Sibirskogo otdeleniya AN SSSR, Novosibirsk.

SINYAKOV, V.I.

Ferruginosity of monticellites. Zap. Vses. min. ob-va 93 no.3: 357-360 '64. (MIRA 18:3)

SINYAKOV, V.I.

Dependence of the microhardness of magnetite on the conditions governing its formation. Geol. i geofiz. no.2:32-40 '65.
(MIRA 18:9)

1. Institut geologii i geofiziki Sibirskogo otdeleniya AN SSSR, Novosibirsk.

ARKHANGEL'SKIY, P.Ye.; BERNSHTEYN, A.M.; BYKOV, M.A.; DLUGACH, M.L.; IL'YASHEVSKIY, Ya.A.; KIRILLOV, A.A.; KOZLOVSKIY, A.S.; KRYLOV, N.V.; LESOV, N.M.; MARTYNOV, P.T.; NIKANDROV, B.I.; PARUNIN, V.Ye.; RUDANOV, M.L.; SINYAKOV, V.K.; FAL'KNER, O.G.; PETRYAKOV, A.I., red.; BALLOD, A.I., tekhn.red.

[Manual on the construction of farm buildings] Spravochnik po sel'skokhoziaistvennomu stroitel'stvu. Moskva, Gos.izd-vo sel'khoz.lit-ry, 1960. 704 p.
(Farm buildings) (MIRA 13:12)

KIRILLOV, A.A., kand.tekhn.nauk; BERGER, F.Ye., inzh.; KORMILITSYN, R.R., inzh.; SINYAKOV, V.K., inzh.

Adhesion of freshly placed concrete to "old" concrete. Gidr.stroi. 32 no.7:28-29 Jl '62. (MIRA 15:7)
(Concrete construction)

KIRILLOV, A.A., kand.tekhn.nauk, dotsent; SINYAKOV, V.K., kand.tekhn. nauk; DAVYDOV, Yu.S., inzh.

Steepness of slopes of underwater trenches. Izv. TSKHA no.3:195-199 '63. (MIRA 16:9)

(Hydraulic structures)

SINYAKOV, V.K., inzh.

Experimental studies on the stability in assembled reinforced concrete supports of tubular section. Izv. TSKhA no.6:199-20?. '61. (MIRA 16:8)

(Reinforced concrete construction)

KIRILLOV, A.A.; SINYAKOV, V.K.; DAVYDOV, Yu.S.

Determining the slope of embankments of underwater pepeline trenches in loose soils. Stroi. truboprov. 8 no.8:14-16 Ag '63. (MIRA 16:11)

GAAB, M.T.; VARNAVSKIY, M.G.; TUMANOV, A.F.; SINYAKOV, V.N.; SONOMATOV, N.A.

Measures for maintaining pressure in petroleum strata. [Suggested by Gaab, M.T.; Varnavskiy, M.G.; Tumanov, A.F.; Sinyakov, V.N., Sonomatov, N.A.] Prom.energ. 12 no.10:22 O '57. (MIRA 10:10)
(Oil field flooding)

S/219/62/053/005/004/004
I015/I215

AUTHOR: Sinyakov, V. S.

TITLE: An ultrasonic apparatus for the determination of the size of individual organs in the living organism

PERIODICAL: Byulleten' eksperimental'noy biologii meditsiny, v. 53, no. 5, 1962, 132–134

TEXT: The apparatus is built according to principles developed by R. F. Rushmer et al. (Circulat. Res. v. 4, 1956, 684). A short ultrasonic impulse (0.5 microsec) is imparted to the organ and the time passage of this impulse through the organ is measured by piezometers located counterlaterally. The ultrasonic carrier frequency is 2.5 megacycles /sec and the impulse frequency is 1000 cycles/sec. The apparatus was tested on dogs with induced aortic insufficiency. The accuracy of determination as well as the minimum measurable size depend mainly on the ultrasonic carrier frequency.

ASSOCIATION: Laboratoriya po razrabotke biofizicheskikh metodov issledovaniya (zav. V. S. Sinyakov) Instituta normal'noy i patologicheskoy fiziologii (Dir. — deystvitel'nyy chlen AMN SSSR V. V. Parin) AMN SSSR (Laboratory of Biophysical Research Methods [headed by V. S. Sinyakov]) Institute of Normal and Pathological Physiology [directed by V. V. Parin, member of the AMS USSR] AMS USSR) Moscow

PRESENTED: by V. V. Parin, member of the AMS USSR

SUBMITTED: May 11, 1961

Card 1/1

KAR[illegible], V.L.; [illegible]AKOV, V.[illegible].

Spatial dynamics of the left ventricle and phase structure of the cardiac circle. Fiziol.zhur. 51 no.7:832-837 '65. (MIRA 18:10)

1. Institut normal'noy i patologicheskoy fiziologii AMN SSSR, Moskva.

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001550810017-3"

SINYAKOV, V.S.

Small-sized 2-channel transistorized stimulator for the electrical stimulation of biological objects. Biul. eksp. biol. i med. [i.e.53] no.3:117-120 Mr '62. (MIRA 15:4)

1. Iz laboratorii po razrabotke biofizicheskikh metodov issledovaniya (zav. V.S.Sinyakov) Instituta normal'noy i patologicheskoy fiziologii (dir. - deystvitel'nyy chlen AMN SSSR V.V.Parin) AMN SSSR, Moskva, Predstavlena deystvitel'nym chlenom AMN SSSR V.V.Parinym.
(ELECTROPHYSIOLOGY--EQUIPMENT AND SUPPLIES)

SINYAKOV, V.S.

Method of continuous recording of the thickness of the myocardium in experiments on animals. Biul. eksp. biol. i med. 55 /i.e. 56/ no.10:114-116 O'63 (MIRA 17:8)

1. Iz laboratorii po razrabotke biofizicheskikh metodoc issledovaniya (zav. - V.S. Sinyakov) Instituta normal'noy i patologicheskoy fiziologii (dir. - deystvitel'nyy chlen AMN SSSR prof. V.V.Parin) AMN SSSR. Predstavlena deystvietl'nym chlenom AMN SSSR V.V. Parinym.

SINYAKOV, Ye. V.

"On the Nature of Additional Conductivity of Di-Electrics in Strong Fields," Zhur. Eksper. i Teoret. Fiz., 11, No. 4, 1941. Mbr., Dnepropetrovsk State Univ., -1940-.

CA

Dynamics of the polarization of barium titanate. E. V.
Sinyakov, R. A. Statikchuk, and B. K. Chernyi (Dnepropetrovsk State Univ.). *Zhur. Eksptl. Teoret. Fiz.* 21, 610-17
(1951).—The dielec. const. ε of $BaTiO_3$ was measured in
rectangular d.c. impulses produced by impacts of steel balls
against a steel plate; variation of the size of the steel balls
permitted variation of the duration of the impulse from
5 × 10^{-6} to 9 × 10^{-6} sec. (1) Within those limits, the
variation of ε as a function of the temp. is unaffected by the
length of the impulse; ε at the Curie point is slightly greater
than in high-frequency (10^6 hertz) a.c. The error inherent
in ballistic measurements in d.c., and due to the cond., is
eliminated in the short rectangular impulse method. (2)
Curves of ε as a function of the elec. field strength E (1-20
kv./cm.), below the Curie point, have a max.; that this is
not due to foregoing polarization at the lower E is demonstrated by the persistence of the shape of the curve and the
max. in expts. in which previous polarization was authentically wiped out by heating to 200° between consecutive
measurements. In cyclic variation of E, below the Curie
point, the polarization Q forms a hysteresis loop even though
satn. is not reached; the 1st loop is distinctly asym. with
respect to the axis of E, but this asymmetry diminishes in
repeated cycles. The spontaneous polarization is of the
order of 4-6.6 × 10^{-6} coulombs/sq. cm. (3) In contrast to
Rochelle salt, the polarization Q in $BaTiO_3$ is not additive,
in the sense that at const. E and temp. the increments of Q
in consecutive equal intervals of time are not equal. In
expts. with impulses of different lengths, 5 × 10^{-6}, 5 × 10^{-6},
or 9 × 10^{-6} sec. each, with each following curve taken down
after prolonged heating of the specimen, plots of Q against
the time t, for the 3 impulse lengths τ, show Q at the same
total t to be much greater with the shorter τ. Owing to this
absence of additivity in $BaTiO_3$, the rate of polarization i,
detd. by the slope of the curve Q(t) at t = 0, is not a true rate
even though it does give some insight into the dynamics of
the process. As illustrated by a curve at E = 3750 v./cm.,
τ = 5.27 × 10^{-6} sec., i as a function of the temp. behaves
as the dielec. const. of $BaTiO_3$, with a peak at about 105°.
As a function of E, below the Curie point, i increases nonlinearly with E, approx. following i = Ae^{aE}, where A and
a are temp.-dependent. Above the Curie point, i is a linear
function of E. Intentional preliminary polarization of a
sample previously depolarized by heating results in a diminished i in a subsequent expt.; that effect increases with in-

over

creasing closeness to the Curie point and decreases rapidly above it. (1) The fact that $BaTiO_3$ is a seignettoelec. substance only in the presence of impurities giving rise to free Ba^{++} ions indicates that its polarization is due to deformation of lattice cells by excess Ba^{++} ions; this effect produces regions of spontaneous polarization through the action of the dipole moment of the deformed cell. The addnl. polarization that arises on application of an external field is the result of the displacement of free Ba^{++} ions. With increasing E, the size of the spontaneous-polarization domains increases until they come into contact with one another, at which point Q reaches satn.; the value of E at which the satn. is reached should decrease with increasing impurity content, and the Curie point should shift to lower temps. The 1st impulse dets. the polarization through growth of the regions of spontaneous polarization and rotation of their elec. dipole moment; the increase of Q in further impulses is attributed to accumulation of weakly bound electrons around the polarized regions, i.e. to increasing space charge. This point of view is corroborated by preliminary expts. on the distribution of the potential in $BaTiO_3$, which below the Curie point remains uniform while the current decreases with time, whereas 30–40° above the Curie point there is no decrease of the current, i.e. no space charge. N. Thon

SINYAKOV, YE. V.

USSR/Electricity - Dielectrics Dec 51

"Effect of Displacing Field on Magnitude of Dielectric Permeability and Dielectric Losses in $BaTiO_3$," Ye. V. Sinyakov, Ye. A. Stafaychuk, L. S. Sinegubova, Dnepropetrovsk State U

"Zhur Eksper i Teoret Fiz" Vol XXI, No 12, pp 1396-1402

Study of thermal behavior of dielec permeability and losses of $BaTiO_3$ under effect of displacing elec field showed shift of Curie point toward higher temp. Found sharp drop of tangent of angle of dielec losses and smoothing of its characteristic max under superposition of

198T13

USSR/Electricity - Dielectrics (Contd) Dec 51

strong displacing field. Observed distortion of hysteresis loop under displacing field effect. Submitted 27 Jan 51.

198T13

SINYAKOV, Ye. V.

USSR/Electricity - Dielectrics Feb 52

"Potential Distribution in Barium Metatitanate and in Other Ceramic Dielectrics," Ye. V. Sinyakov, B. K Chernyy, Chair of Electrophys, Dnepropetrovsk State U

"Zhur Tekh Fiz" Vol XXII, No 2, pp 265-267

Test results proved that potential distribution in all tested materials TiO_2, (Ba - Sr) TiO_3 and $BaTiO_3$ remains linear in a wide range of temp and is independent of time during which sample is exposed to elec field. These results agree with conclusions by Ksendzov (cf. "Zhur Tekh Fiz" 20, 117, 1950) stating that titanium dioxide consists of a dielec and a semiconducting phase. Received 29 May 51.

209T53

[illegible], [illegible], [illegible], [illegible]

Polarization (Electricity)

Authors' reply to remarks of [illegible] S. Kosman on their article "Dynamics of polarization process of barium titanate." Zhur. eksp. i teor. fiz. 23 No. 2, 1952.

9. Monthly List of Russian Accessions, Library of Congress, December 1952, Uncl.

SINYAKOV, E. V.

USSR/Physics - Seignette's ceramics

Card 1/1 Pub. 22 - 13/52

Authors : Sinyakov, E. V. and Izhak, I. A.

Title : Effect of mechanical pressure on the dielectric constants of segneto-ceramics.

Periodical : Dok. AN SSSR 100/2, 243-246, Jan 11, 1955

Abstract : Experiments with Seignette's ceramics are described. The experiments were conducted for the purpose of finding out the effect of mechanical pressures on the dielectric constant of Seignette's ceramics. The dependence of the Curie point on the pressure is also established. Four references: 3 USSR, 1 USA (1945-1951) Graphs; table.

Institution : Dnepropelrovsk State University

Presented by : Academician A. F. Ioffe, September 10, 1954

Sinyakov E. V.

Investigation of the dependence of the dielectric constant and the tangent of the dielectric loss angle of barium titanate on the intensity of a high frequency field [illegible]

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USSR / Radiophysics

Abs Jour : Ref Zhur - Fizika, No 4, 1957, No 10035

Author : Sinyakov, E.V., Galpern, V.V.
Inst : Dnepropetrovsk University, USSR

Title : Investigation of the Dependence of the Dielectric Constant and the Tangent of the Dielectric Loss Angle of Barium Titanate on the Intensity of the High Frequency Electric Field.

Orig Pub : Zh. eksperim. i teor. fiziki, 1956, 30, No 4, 675-680

Abstract : A method is described for the investigation of the dependence of the dielectric constant and the tangent of the dielectric loss angle of barium titanate on the electric field intensity at various temperatures with the aid of a measuring circuit, containing a linear variable capacitor, whose rotor is driven by electric motor at 1,500 rpm. During one half of the period, the capacitance varies linearly, and during the second half it diminishes. Over this cycle, upon suitable choice of parameters, the circuit is twice in resonance with the generator, and the resonance is fixed on the oscillogram in the form of two resonance curves. By connecting

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USSR / Radiophysics

Abs Jour : Ref Zhur - Fizika, No 4, 1957, No 10035

Abstract : the tested capacitor in parallel the peaks of the resonant curves are shifted by an amount proportional to the capacitance connected; the shift serves as a measure of this capacitance. Heating of the specimen upon application of a high field (up to 3.2 kv/cm) is prevented by the short time of application of the high frequency field (0.1 seconds). The maximum error in the measurement of capacity is estimated at 2%, and in the measurement of the tangent of the loss angle at 25%.

The tangent of the dielectric loss angle is determined by the method whereby the circuit is detuned as the voltage is measured with a vacuum tube voltmeter.

It is shown that the non linearity of C = f (E), the temperature behavior of the capacitance, and the tangent of the loss angle for barium titanate at high frequency and in strong fields all have a character analogous to that observed in weak

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I

USSR / Radiophysics

Abs Jour : Ref Zhur - Fizika, No 4, 1957, No 10035

Abstract : fields. At a frequency of 1 Mc the capacitance is less and the nonlinear properties are less strongly pronounced than at a frequency of 50 cycles. In addition, the tangent of the loss angle depends weakly on the field intensity. A more pronounced manifestation of the nonlinear properties of barium titanate in the region of the Curie point is attributed by the authors to the fact that the rotation of the moments under the influence of the external field is facilitated in this region.

Card : 3/3

SINYAKOV, E.V.

537.226/.227 : 546.431.824-31 802

2

Investigation of the Dependence of the Permittivity and the Tangent of the Dielectric Loss Angle of Barium Titanate on the Strength of a High-Frequency Electric Field. E. V. Sinyakov & V. V. Gal'perin. (Zh. tekh. Fiz., 1956, Vol. 30, No. 4, pp. 675–680.) Results of an experimental investigation show that (*a*) the nonlinear properties of the material are less pronounced at a frequency of 1 Mc/s than at 50 c/s, (*b*) the nonlinear effects are most pronounced near the Curie temperature, and (*c*) tan δ depends only weakly on the field strength at 1 Mc/s. Results of measurements at field strengths up to about 10 kV/cm are presented graphically.

SINYAKOV, Ye.V.; CHERNYY, B.K.

X-ray diffraction study of the system $BaTiO_3$ - $NiO \cdot ZrO_2$.
Fiz. tver. tela 1 no.2:352-354 F '59. (MIRA 12:5)

1.Dnepropetrovskiy gosudarstvennyy universitet.
(Systems (Chemistry)) (X-ray crystallography)

69441
S/139/60/000/01/015/041
E201/E491

24.7900

AUTHORS: Sinyakov, Ye.V., Avramenko, V.P., Kudzin, A.Yu. and Zuyev, A.F.

TITLE: Investigation of Magnetic Properties of Certain Mixed Ferrites

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, 1960, Nr 1, pp 80-86 (USSR)

ABSTRACT: The authors investigated magnetic properties of the following mixed ferrite systems:

$nNiAl_2O_4 - 100NiFe_2O_4$ (I) $nCoAl_2O_4 - 100NiFe_2O_4$ (II)

$nNiMn_2O_4 - 100NiFe_2O_4$ (III) $nCoFe_2O_4 - 100MnFe_2O_4$ (IV)

where n = 0.5, 1, 3, 5, 10, 15, 20, 30, 40 and is the molar ratio. In these systems one of the components is non-ferromagnetic ($NiAl_2O_4$, $CoAl_2O_4$ and $NiMn_2O_4$), except in the case of IV where both components are ferromagnetic. Samples were prepared employing the usual ceramic techniques; oxides or carbonates of "pure" and "pure for analysis" grades were used. Samples were

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Investigation of Magnetic Properties of Certain Mixed Ferrites

annealed at 1380°C for two hours or at 1420°C for one hour. X-ray diffraction patterns showed that all ferrites had spinel structure and were solid solutions (Table 1). The following properties were investigated: the temperature dependences of the initial permeability μ_0, of tan δ and of spontaneous magnetization; the dependences $B = f(H)$, and $\mu = f(H)$; the coercive force and the Curie point. The concentration dependences of μ_0 of the saturation magnetization B and of the Curie temperature (θ) are shown in Fig 1 and 2 for systems I and II respectively. Fig 3 shows the temperature dependence of the Q-factor of coils with toroidal cores made of system I ferrites. Fig 4 gives the temperature dependence of μ_0 for system III. Fig 5 and 6 show the concentration dependences of μ_0, of B and of θ for systems III and IV respectively. It was found that introduction of a non-ferromagnetic component lowers the Curie temperature, reduces the saturation magnetization B and raises the coercive

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S/139/60/000/01/015/041
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Investigation of Magnetic Properties of Certain Mixed Ferrites

force. These results can be explained using the theory of antiferromagnetism. For system IV ferrites (with both components ferromagnetic) the law of additive variation of properties with concentration was obtained. The losses in all ferrites were due to magnetic polarity reversal. There are 6 figures, 1 table and 12 references, 5 of which are Soviet, 4 English and 3 translations from English into Russian.

ASSOCIATION: Dnepropetrovskiy gosuniversitet (Dnepropetrovsk State University)

SUBMITTED: September 19, 1958

Card 3/3

S/181/60/002/01/18/035
B008/B014

24.7800

AUTHORS: Sinyakov, Ye. V., Stafiychuk, Ye. A.

TITLE: Solid Solutions of Niobates and Tantalates of Transition Elements Formed on the Basis of $BaTiO_3$

PERIODICAL: Fizika tverdogo tela, 1960, Vol. 2, No. 1, pp. 73-79

TEXT: The authors examined niobates and tantalates of Mn, Co, and Ni as well as their solid solutions on the basis of $BaTiO_3$. The samples were prepared by the usual ceramic procedure. The authors prepared compounds corresponding to the formulas AB_2O_6 and $A_2B_2O_7$ (A = Mn, Co, Ni; B = Nb, Ta) and their solid solutions ranging from 0.5 to 7 mole% in $BaTiO_3$. The dielectric constant of compounds of the types AB_2O_6 and $A_2B_2O_7$ within the range of -195 to +195°C was found to be independent of temperature. The quantities ε and tan δ are indicated in Table 1. The compounds mentioned are not piezoelectric. Figs. 1-2 illustrate temperature dependences of ε for systems of the type $BaTiO_3$-AB_2O_6. Addition of more

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Solid Solutions of Niobates and Tantalates of Transition Elements Formed on the Basis of $BaTiO_3$ S/181/60/002/01/18/035 B008/B014

than 1 mole% of AB_2O_6 to $BaTiO_3$ causes the piezoelectric properties of barium titanate to vanish. Solid solutions of $BaTiO_3$ with pyroniobates and tantalates of Mn, Co, and Ni (Figs. 3-7) differ greatly in their properties. A strong shift of the Curie point toward lower temperatures may be observed in all compounds of $BaTiO_3$-$A_2B_2O_7$ under consideration (Fig. 8, Table 2). All solid solutions of the systems $BaTiO_3$-$A_2B_2O_7$ are piezoelectrics. Some of them have hysteresis loops of a marked rectangular shape and a non-linearity exceeding largely that of $BaTiO_3$. A comparison of the electric properties of the systems under review reveals that AB_2O_6-$BaTiO_3$ and $A_2B_2O_7$-$BaTiO_3$ differ very much in their composition. It may be assumed that the addition of AB_2O_6 to barium titanate leads to structural deformations. This was established on the basis of strongly blurred lines on X-ray pictures of the samples and on the basis of a strong deformation of the samples after sintering (Fig. 9). Presumably, this deformation may be considered to be the reason for the

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disappearance of piezoelectric properties. On the strength of X-ray analysis and the shift of Curie points, the authors detected the formation of solid solutions of the second type in $BaTiO_3-A_2B_2O_7$ systems throughout the range of concentration. The results obtained here differ from data published in Ref. 8 on the effect of barium niobates and tantalates on $BaTiO_3$. Presumably, the differing properties of the $BaTiO_3-AB_2O_6$ and $BaTiO_3-A_2B_2O_7$ systems are due to the existence of compounds of transition elements in the various compositions. The samples were prepared in collaboration with L. Kolomiyets and Zh. Bichuch. There are 9 figures, 2 tables, and 11 references, 4 of which are Soviet.

ASSOCIATION: Dnepropetrovskiy gosudarstvennyy universitet (Dnepropetrovsk State University)

SUBMITTED: April 6, 1959

AVRAMENKO, V.P.; SINYAKOV, Ye.V. [Syniakov, O.V.]

Investigating the electric properties of certain mixed ferrites.
Ukr. fiz. zhur. 5 no.6:791-798 N-D '60. (MIRA 14:3)

1. Dnepropetrovskiy gosudarstvennyy universitet.
(Ferrates—Electric properties)

S/048/60/024/02/03/009
B006/B014

24.2130

AUTHORS: Sinyakov, Ye. V., Solok, A. M.

TITLE: Relaxation Polarization of the System $SrTiO_3 \cdot nMnO$

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960, Vol. 24, No. 2, pp. 132 - 135

TEXT: The article under review was read at the Second All-Union Conference on the Physics of Dielectrics (Moscow, November 20 - 27, 1958). In continuation of the studies made by G. I. Skanavi and others concerning relaxation losses, the authors conducted relevant investigations on ceramic samples of $SrTiO_3 \cdot nMnO$ of different compositions. This system was chosen in order to investigate the influence of manganese ions on the dielectric polarization of strontium titanate. $MnCO_3$ is dissociated on heating the atmosphere in MnO and CO_2; on further heating, MnO is oxidized to "kurnakite", hausmannite, and other oxides. Hence, the occurrence of relaxation polarization is to be expected in the presence of ions of trivalent manganese in $SrTiO_3$. The composition of the samples investigated is given in Table 1. ε and $\tan\delta$ were measured at 1.5 and 12 Mc/sec

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Relaxation Polarization of the System $SrTiO_3 \cdot nMnO$

S/048/60/024/02/03/009
B006/B014

by using a Q-meter of the type KV-1 in a wide temperature range. Results are given in two diagrams and a further table. Fig. 1 shows the temperature dependence of ε and $\tan\vartheta$ on samples with 97 $SrTiO_3$ + 3 MnO at different frequencies. The maximum of the temperature dependence on ε is found to shift toward higher temperatures with rising frequency. The existence of this temperature maximum and its shift are indicative of a relaxation polarization in this system. To clarify the structure of these samples, an X-ray structural analysis was made, the results of which are discussed and given in Table 2. Fig. 2 shows the temperature dependence of ε and $\tan\vartheta$ in samples of the system $Bi_2O_3 \cdot nMnO$ (n = 1,2,3). In this system, ε is very strongly dependent on temperature. Its values at three different temperatures are given in Table 3, as well as the values of $\tan\vartheta$ for the compositions $(100-n)SrTiO_3 + n(Bi_2O_3 \cdot MnO)$ for n = 1, 3, 5, and 10. In conclusion, it is stated that (1) the introduction of manganese oxides into $SrTiO_3$ leads to the appearance of ionic relaxation polarization; (2) relaxation polarization also occurs in the system $Bi_2O_3 \cdot nMnO$, in which the relaxation of weakly bound electrons is possible in consequence of

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Relaxation Polarization of the System $SrTiO_3.nMnO$

S/048/60/024/02/03/009
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the simultaneous presence of bivalent and trivalent manganese, i.e., $Mn^{2+} \rightarrow Mn^{3+}$ transitions are possible; (3) simultaneous presence of weakly bound ions and electrons is possible in the system $SrTiO_3.n(Bi_2O_3.MnO)$. There are 2 figures, 3 tables, and 4 Soviet references.

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85011

S/048/60/024/010/020/033
B013/B063

9.4300 (1137,1138,1143)

AUTHORS: Sinyakov, Ye. V. and Chernyy, B. K.

TITLE: The Problem of the Electrical Conductivity of Barium Titanate and of Some Solid Solutions on Its Basis

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960, Vol. 24, No. 10, pp. 1255 - 1258

TEXT: The authors studied the activation energy of alkali earth perovskites. Table 1 lists values for the activation energy of alkali earth titanates on the basis of Ref.1 and measurements of $BaZrO_3$ and $SrZrO_3$. Table 2 contains the activation energies of solid $Ba(Ti,Zr)O_3$ and $Ba(Ti,Sn)O_3$ solutions with an increase of the concentration of $BaZrO_3$ and $BaSnO_3$ according to data from Ref.3. These data indicate that the conduction band in barium titanate is formed by the levels of titanium ions. The investigations described in Ref.5 and in the present paper show that a jumplike rise of electrical conductivity occurs at the

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The Problem of the Electrical Conductivity of Barium Titanate and of Some Solid Solutions on Its Basis

Curie point. Fig.1 shows the functions of $\log\sigma = f(1/T)$ for barium titanate with or without admixtures. The percentual content of admixtures in $BaTiO_3$, the Curie points, and the values of resistivity for the compositions under consideration are specified in Table 3. It is noted that the increase of electrical conductivity in the region of phase transition is primarily due to a re-formation of the lattice and a lowering of the conduction band. The electrical conductivity of solid $(Ba,Ni)(Ti,Zr)O_3$ and $(Ba,Co)(Ti,Zr)O_3$ solutions was studied between 260 and 50°C within a field of 0.55 kv cm^{-1}. The dependence of electrical conductivity at 181°C and of the activation energy upon the composition is illustrated in Fig.3. It was found that in the system $(Ba,Ni)(Ti,Zr)O_3$, the decrease of electrical conductivity in the region of formation of solid solutions is related to the substitution of barium ions by nickel ions. Substitution of barium ions by cobalt ions in the system $(Ba,Co)(Ti,Zr)O_3$ leads to an increase of electrical conductivity. A reverse effect of nickel and cobalt ions, observed by the authors, is

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The Problem of the Electrical Conductivity of Barium Titanate and of Some Solid Solutions on Its Basis

probably related to the fact that the electron shells of these ions are filled ($Ni^{2+}-3d^8$; $Co^{2+}-3d^7$). The thermo-emf was measured on the same samples as the electrical conductivity. The coefficient of the thermo-emf as a function of log σ for the system $(Ba,Co)(Ti,Zr)O_3$ is illustrated in Fig.3. It may be seen that the relation $\alpha = A - C \log \sigma$ (Fig.3) which is well known for impurity semiconductors is valid in this case. α is the coefficient of the thermo-emf, σ the electrical conductivity, and A and C are constants. The value of C determined for $(Ba,Co)(Ti,Zr)O_3$ is similar to the theoretical value ($2 \cdot 10^{-4}$). In the case of barium titanate and solid solutions of $(Ba,Ni)(Ti,Zr)O_3$, C is three or four times greater than the theoretical value. The present paper was read at the Third Conference on Piezoelectricity, which took place in Moscow from January 25 to 30, 1960. There are 3 figures, 3 tables, and 10 references: 8 Soviet.

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85884

S/048/60/024/011/020/036
B006/B056

9.2180 (3203,1162)
24.7700 (1043,1143)

AUTHORS: Stafiychuk, Ye. A. and Sinyakov, Ye. V.

TITLE: The Electrical Conductivity of Solid Solutions of Niobates and Tantalates of Mn, Co, and Ni on a $BaTiO_3$ Basis

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960, Vol. 24, No. 11, pp. 1380 - 1383

TEXT: The present paper is a reproduction of a lecture delivered on the 3rd Conference on Ferroelectricity, which took place in Moscow from January 25 to 30, 1960. The authors investigated the dielectric properties of polycrystalline samples of solid solutions of Mn-, Co-, and Ni-niobates and -tantalates on a $BaTiO_3$ basis in variable electric fields, and give a report on the results obtained with respect to the temperature- and concentration dependence of the electrical conductivity, the thermo-emf, as well as of the influence exerted by Mn^{2+}-, Co^{2+}-, and Ni^{2+}-ions upon the electrical conductivity of $BaTiO_3$. The production of

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The Electrical Conductivity of Solid Solutions of Niobates and Tantalates of Mn, Co, and Ni on a $BaTiO_3$ Basis

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B006/B056

the samples had been described in Ref.1. On the disk-shaped samples, platinum electrodes were fixed by means of cathode sputtering. The investigations were made within the temperature range of 50-200°C and with fields of the order of 20 v/mm. The most important results of the measurements are given in Tables 1 and 2. The "compounds" given in the form "$A_2B_2O_7$" showed a break in the curve $\log \sigma = f(1/T)$. The temperature at the break, the activation energy (calculated according to the formula $\sigma = \sigma_0 \exp(-u/2kT)$, and the resistivity increase during the transition from Mn → Ni. The results obtained by investigating the influence exerted by the various ions upon the ferroelectric properties of $BaTiO_3$ are given in Table 2. The temperature dependence of the thermo-emf α is shown in the three diagrams of Fig.2 for the solid solutions of the kind $BaTiO_3$ - "$A_2B_2O_7$" for various concentrations of the additions. The $\alpha(t)$-curves take a considerably different course and partly also differ considerably only in the case of different additional concentrations. Thus, e.g., $BaTiO_3$ with 1 mole% "$Mn_2Ta_2O_7$" shows a α decreasing

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The Electrical Conductivity of Solid Solutions of Niobates and Tantalates of Mn, Co, and Ni on a $BaTiO_3$ Basis

S/048/60/024/011/020/036
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exponentially with temperature, and with 0.5 ... increases exponentially with temperature (between 70 and 150°C). There are 2 figures, 2 tables, and 4 references: 2 Soviet and 2 Japanese.

Таблица 1

Table 1

Соединение 1	U, eV 2	$\rho_{уд}$ при 149°, Ω см 3	Соединение 4	U_1, eV 5	U_2, eV 6	Температура излома, °C 7	$\rho_{уд}$ при 149°, Ω см 8
$MnTa_2O_6$	1,84	$1{,}03\cdot10^{11}$	«$Mn_2Ta_2O_7$»	0,54	1,02	115	$6\cdot10^{6}$
$CoTa_2O_6$	1,7	$3{,}57\cdot10^{11}$	«$Co_2Ta_2O_7$»	0,62	1,16	127	$2\cdot10^{7}$
$NiTa_2O_6$	1,68	$3\cdot10^{10}$	«$Ni_2Ta_2O_7$»	1,92	1,56	153	$4\cdot10^{10}$
$MnNb_2O_6$	1,08	$2{,}49\cdot10^{9}$	«$Mn_2Nb_2O_7$»	1,38	—	—	$1{,}6\cdot10^{7}$
$CoNb_2O_6$	1,56	$2{,}99\cdot10^{10}$	«$Co_2Nb_2O_7$»	1,46	1,76	113	$5{,}2\cdot10^{7}$
$NiNb_2O_6$	1,74	$7{,}7\cdot10^{11}$	«$Ni_2Nb_2O_7$»	1,62	1,19	150	$6{,}2\cdot10^{11}$

Legend to Table 1: 1) Compound; 2) U, 3) resistivity at 149°C, 4) compound, 5) U_1, 6) U_2, 7) temperature of the breaking point, 8) resistivity at 149°C.

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Table 2

Добавка	Мол. %	U_1, eV	U_2, eV	$\rho_{уд}$ при 161°, Ω см
1	2	3	4	5
$NiNb_2O_6$	1	2,6	1,2	$8\cdot10^{11}$
	2	1,74	0,84	$4\cdot10^{11}$
	3	1,44	0,14	$1,5\cdot10^{13}$
	5	1,6	0,8	$3,6\cdot10^{14}$
$CoNb_2O_6$	1	1,6	0,52	$1,6\cdot10^{11}$
	2	1,16	0,42	$1,3\cdot10^{11}$
	3	0,78	—	$2,9\cdot10^{10}$
	5	0,76	0,54	$1,8\cdot10^{10}$
$MnNb_2O_6$	0,5	2,0	0,4	$7,5\cdot10^{12}$
	1	1,68	1,2	$2,1\cdot10^{12}$
	2	1,02	—	$3,7\cdot10^{11}$
	3	1,04	—	$2,9\cdot10^{10}$
	5	1,04	0,96	$2,3\cdot10^{10}$
	7	1,12	1,04	$5,1\cdot10^{9}$
«$Ni_2Nb_2O_7$»	1	1,82	0,6	$3,1\cdot10^{11}$
	2	1,9	0,7	$3\cdot10^{11}$
	3	1,52	1,02	$3,28\cdot10^{11}$
	5	1,4	1,14	$1,98\cdot10^{11}$
«$Co_2Nb_2O_7$»	1	1,2	0,86	$8,2\cdot10^{9}$
	2	0,78	—	$1,9\cdot10^{8}$
	3	0,92	—	$2,3\cdot10^{8}$
	5	1,28	—	$2\cdot10^{8}$
«$Mn_2Nb_2O_7$»	0,5	1,3	1,2	$3,8\cdot10^{10}$
	1	0,98	0,98	$1\cdot10^{10}$
	2	1,12	—	$9,8\cdot10^{8}$
	3	1,04	0,88	$3,8\cdot10^{8}$
	5	0,98	—	$1,3\cdot10^{8}$
	7	1,0	—	$6\cdot10^{7}$

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Table 2

$\rho_{уд}$ при 80°, Ω см 6	Температура излома 7	Добавка 1	Мол. % 2	U_1, eV 3
$4,3\cdot10^{11}$	138; 78	$NiTa_2O_6$	1	1,78
$1,2\cdot10^{13}$	127		2	1,78
$5,6\cdot10^{13}$	127		—	—
$1,1\cdot10^{15}$	138		—	—
$8,9\cdot10^{11}$	181	$CoTa_2O_6$	1	0,7
$5,1\cdot10^{11}$	147		2	0,8
$3,3\cdot10^{11}$	—		3	0,88
$8,5\cdot10^{10}$	144		5	1,0
$2,10^{13}$	Ск. 109	$MnTa_2O_6$	—	—
$1,6\cdot10^{13}$	Ск. 97		1	1,12
$8,4\cdot10^{13}$	—		2	1,05
$5,6\cdot10^{11}$	—		3	1,0
$6,1\cdot10^{11}$	145		—	—
$1,3\cdot10^{11}$	140		7	1,04
$1,1\cdot10^{13}$	124	«$Ni_2Ta_2O_7$»	1	2,18
$5,2\cdot10^{13}$	147		2	1,84
$3,9\cdot10^{13}$	91		3	1,5
$1,45\cdot10^{13}$	80		5	1,2
$9,4\cdot10^{10}$	185	«$Co_2Ta_2O_7$»	1	0,78
$1\cdot10^{10}$	—		2	0,82
$3,6\cdot10^{9}$	—		3	0,96
$1,6\cdot10^{9}$	—		5	1,2
$4,1\cdot10^{13}$	Ск. 109	«$Mn_2Ta_2O_7$»	0,5	1,5
$1,2\cdot10^{11}$	119		1	1,04
$1,6\cdot10^{10}$	—		2	0,96
$6,4\cdot10^{9}$	130		3	0,96
$2,6\cdot10^{9}$	—		5	0,92
$1,2\cdot10^{9}$	—		—	—

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Table 2

U_2, eV	$\rho_{уд}$ при 150°, Ω см	$\rho_{уд}$ при 70°, Ω см	Температура излома
4	5	6	7
0,7	$1,96 \cdot 10^{11}$	—	145; 98
0,84	$2,6 \cdot 10^{12}$	$2,8 \cdot 10^{13}$	145
—	—	—	—
—	—	—	—
0,54	$5,4 \cdot 10^{10}$	$2,5 \cdot 10^{11}$	132
0,64	$1,2 \cdot 10^{11}$	$8,9 \cdot 10^{11}$	150
0,6	$1,4 \cdot 10^{10}$	$1,7 \cdot 10^{12}$	90
0,8	$5,2 \cdot 10^{10}$	$7,3 \cdot 10^{11}$	123
—	—	—	—
—	$1,3 \cdot 10^{11}$	$6,10^{11}$	Ск. 95
0,84	$9,5 \cdot 10^{9}$	$1,9 \cdot 10^{11}$	113
—	$6,6 \cdot 10^{9}$	$1,7 \cdot 10^{11}$	—
—	—	—	—
—	$9,7 \cdot 10^{8}$	$2,5 \cdot 10^{10}$	—
0,88	$3,5 \cdot 10^{10}$	$2,7 \cdot 10^{11}$	147
1,0	$1,2 \cdot 10^{10}$	$5,2 \cdot 10^{11}$	134
1,2	$3,6 \cdot 10^{12}$	$1,2 \cdot 10^{11}$	130
—	$2,5 \cdot 10^{10}$	$1,5 \cdot 10^{12}$	—
—	$2 \cdot 10^{10}$	$2 \cdot 10^{11}$	—
—	$2,2 \cdot 10^{8}$	$2,8 \cdot 10^{9}$	—
—	$2,2 \cdot 10^{8}$	$3,7 \cdot 10^{9}$	—
—	$1,1 \cdot 10^{9}$	$4,3 \cdot 10^{10}$	—
—	$1 \cdot 10^{11}$	$6 \cdot 10^{11}$	Ск. 104
0,82	$2,9 \cdot 10^{11}$	$6 \cdot 10^{10}$	132
—	$2,6 \cdot 10^{8}$	$5,8 \cdot 10^{9}$	—
—	$6,2 \cdot 10^{8}$	$1,2 \cdot 10^{9}$	—
—	$1,5 \cdot 10^{7}$	$2,6 \cdot 10^{8}$	—
—	—	—	—

Legend to Table 2: 1) addition, 2) concentration in mole%, 3) U_1, 4) U_2, 5) resistivity at 161°C, 6) resistivity at 80°C, 7) temperature of the break.

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85885

S/048/60/024/011/021/036
B006/B060

24.7300(1043,1145,1160)

AUTHORS: Sinyakov, Ye. V. and Stafiychuk, Ye. A.

TITLE: Properties of Some Solid Solutions of the Type $BaTiO_3$-"$A_2B_2O_7$" in Strong Electric Fields

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960, Vol. 24, No. 11, pp. 1384-1386

TEXT: This is the reproduction of a lecture delivered at the Third Conference on Ferroelectricity which took place in Moscow from January 25 to 30, 1960. The authors examined specimens of compositions AO - B_2O_5, 2AO - B_2O_5, where A: Mn, Co, Ni and B: Nb or Ta, as well as their solid solutions on $BaTiO_3$ basis. The compositions 2AO - B_2O_5 proved to be a mixture of meta-compounds with oxides of bivalent metals and are called "pyrocompounds". The nonlinear properties of the specimens were measured at 50 cps with an instrument described in Ref. 6 at temperatures which were about equally distant from the Curie point. The measurement results are graphically shown in Figs. 1, 2 and numerically compiled in a Table.

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S/048/60/024/011/021/036
B006/B060

Properties of Some Solid Solutions of the Type $BaTiO_3$-"$A_2B_2O_7$" in Strong Electric Fields

Position and height of the peaks of the $\varepsilon(E)$ curves are greatly dependent on the addition; $BaTiO_3$ - "$Ni_2Ta_2O_7$" has, e.g., for 0 and 1 mole% addition about the same $\varepsilon(E)$ curves, while at 2 mole% the maximum lies at smaller E and is considerably higher, and at 3 mole% the $\varepsilon(E)$ curve is considerably lower, the maximum being small and appearing only at large E values. Fig. 2 shows the effect of additions upon height and position of the maxima of the $\varepsilon(E)$ curves. Investigation results are in good agreement with X-ray and high-frequency experiments. It was found that the introduction of bivalent cations of transition metals causes the tetragonality of unit cells to drop considerably and that the Curie point is markedly shifted toward low temperatures. The greatest nonlinearity is found in such compounds as exhibit the least tetragonalities, i.e., those with Ni^{2+} ions. Although the ionic radii of Mn^{2+}, Co^{2+}, and Ni^{2+} are not differing appreciably, they still have quite different effects upon the properties of solid solutions on $BaTiO_3$ basis, which fact is explained by the different filling of the 3d subshells of these ions. There are 2 figures, 1 table, and 7 references: 5 Soviet, 1 British, and 1 US.

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85885

S/048/60/024/011/021/036
B006/B060

Properties of Some Solid Solutions of the Type $BaTiO_3$-"$A_2B_2O_7$" in Strong Electric Fields

1 Добавка	1 мол. %				2 мол. %			3 мол. %		
	θ, °C	E_m, kV см$^{-1}$	ε_m	c/a	θ, °C	E_m, kV см$^{-1}$	ε_m	θ, °C	E_m, kV см$^{-1}$	ε_m
«$Mn_2Nb_2O_7$»	90	7	10800	$1,007_4$	35	3,3	16000	—25	12	5100
«$Co_2Nb_2O_7$»	82	5	12000	$1,005_4$	22	2,2	20800	—70	8,6	7340
«$Ni_2Nb_2O_7$»	73	4,3	9750	$1,003_7$	1	1,09	32400	—95	6,86	9500
«$Mn_2Ta_2O_7$»	82	7,6	8100	$1,006_4$	44	2,98	11000	8	—	—
«$Co_2Ta_2O_7$»	85	6,18	12800	$1,004_9$	7	1,95	10400	—76	9,23	5200
«$Ni_2Ta_2O_7$»	66	3,2	14900	$1,004_5$	—7	1,45	28000	—108	4,14	8040

Legend to the Table: Nonlinear properties of the solutions of the $BaTiO_3$ - $AOAB_2O_6$ type. 1) Addition. The subscript m denotes the value at the $\varepsilon(E)$ curve maximum.

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20116

9.4300 (and 1155, 1147)

S/181/61/003/002/014/050
B102/B204

AUTHORS: Sinyakov, Ye. V. and Avramenko, V. P.

TITLE: Investigation of the electric properties of some mixed ferrites in variable electric fields

PERIODICAL: Fizika tverdogo tela, v. 3, no. 2, 1961, 411-415

TEXT: Though ferrites are being more and more used in industry, their electric properties, especially in solid solutions of ferrites, have been insufficiently investigated. The electric properties of ferrites have some peculiarities, as e.g. the high value of ε at low frequencies; ε decreases with increasing frequency. Whereas, the high ε-value and its frequency dependence is explained by many authors by the kind of crystalline structure, V. A. Ioffe et al. were able to show that the behavior of the ε of ferrites does not depend on the crystalline structure but is due to relaxation processes. As a contribution to this set of problems, the authors investigated the temperature dependence of ε and $\tan\delta$ of mixed ferrites, the mechanism of polarization and dielectric losses, as well as the dependence of these characteristics on the

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composition of the following four systems of ferrites
$(100 - n)NiFe_2O_4 - nCoAl_2O_4$, $(100 - n)NiFe_2O_4 - nNiAl_2O_4$,
$(100 - n)NiFe_2O_4 - nNiMn_2O_4$, $(100 - n)CoFe_2O_4 - nZnFe_2O_4$,
n = 0.5, 1, 3, 5, 10, 15, 20, 30, 40 mole%. The specimens were produced in the same manner that is usual in semiconductor ceramics. They had the shape of 1.5-2 mm thick disks (35 mm diameter). The temperature dependence of ε and of $\tan\delta$ was measured by means of Q-meters of the type КВ-1 (KV-1) and УК-1 (UK-1) between 20 and 260°C and 10^6-10^7 cps. Measurements were carried out of some specimens also down to nitrogen temperature. The cooling rate was 1 deg/min within the range of from 20-260°C, in the low temperature range 1.5 deg/min. Temperature measurements had an accuracy of up to ± 1.5°C. The results obtained by the investigations are all graphically represented. Figs. 1 and 2 show $\varepsilon(t)$ and $\tan\delta = f(t)$ of the system $(100 - n)NiFe_2O_4 - nCoAl_2O_4$. Analogous curves were obtained also for other systems. ε and $\tan\delta$ generally decrease with increasing number of additional components,

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Investigation of the electric ... S/181/61/003/002/014/050 B102/B204

with the exception of the system $(100 - n)NiFe_2O_4 - nNiMn_2O_4$, where $\tan\delta$ increases with increasing n. Also electric conductivity decreases in all systems, with the exception of the aforementioned, with increasing n. For the purpose of investigating the character of the losses, $\tan\delta$ was calculated by the formula $\tan\delta = 1.8\cdot10^{12}\,\sigma/\varepsilon f$, and compared with the measured values for the system $(100 - n)NiFe_2O_4 - nNiMn_2O_4$. The measured values at low temperatures ($< 80°C$) are somewhat higher. At low temperatures, the curves $\tan\delta = f(t)$ have a maximum, which proves the relaxation character of the losses. A comparison of the activation energies calculated from the temperature functions of σ and $\tan\delta$ indicate that electron relaxations are concerned. This was proved by direct measurements of $\log(\tan\delta) = f(1/T)$. Thus, all results confirm that the dielectric polarization and the losses of these ferrite systems have relaxation character and are caused by electron exchange between 2- and 3-valent metal ions, which are located in the same lattice sites. There are 8 figures and 7 references: 3 Soviet-bloc and 4 non-Soviet-bloc. 4

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Investigation of the electric ...

S/181/61/003/002/014/050
B102/B204

ASSOCIATION: Dnepropetrovskiy gosudarstvennyy universitet Kafedra elektrofiziki (Dnepropetrovsk State University, Department of Electrophysics)

SUBMITTED: April 23, 1960

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S/181/61/003/002/014/050
B102/B204

Investigation of the electric ...

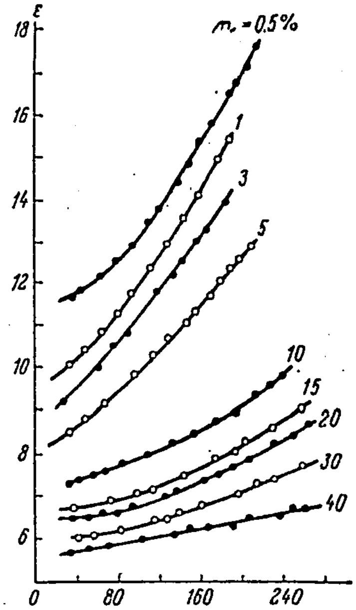

Fig. 1

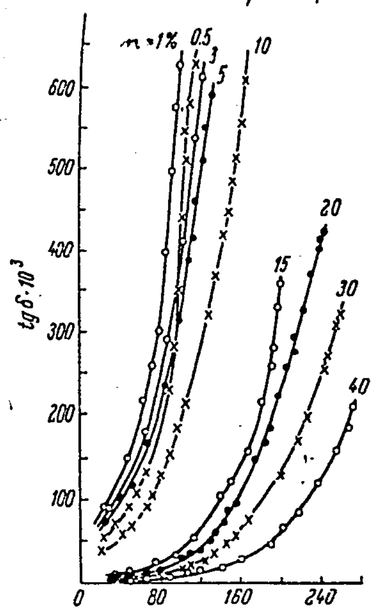

Fig. 2

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SINYAKOV, Ye. V.; AVRAMENKO, V.P.

Investigating the electrical properties of some composite ferrites in alternating electric fields. Fiz. tver. tela 3 no.3:411-415 F '61. (MIRA 14:6)

1. Dnepropetrovskiy gosudarstvennyy universitet, kafedra elektrofiziki.

(Ferrates--Electric properties)
(Electric fields)

S/181/62/004/010/052/063
B102/B104

AUTHORS: Sinyakov, Ye. V., and Dudnik, Ye. F.

TITLE: Seignettoelectrical properties of $SrNb_2O_6$-0.5 YbFeO

PERIODICAL: Fizika tverdogo tela, v. 4, no. 10, 1962, 2971 - 2972

TEXT: A new compound showing at the same time seignettoelectrical and ferrimagnetic properties was synthesized: $SrNb_2O_6$-0.5$YbFeO_3$. The temperature of preannealing was 1100°C, that of final annealing 1270°C. A proper choice of the final cooling rate is of great importance to ensure the desired properties in the ceramic. The seignettoelectrical state was verified by measurements of $\varepsilon(t)$ between -160 and +160°C and of $\varepsilon(E)$ between 0 and 12 kv/cm, the magnetic properties by determining the initial magnetic permeability at 7.8 Mc/sec. This was equal to 5 at room temperature. There are 2 figures.

ASSOCIATION: Dnepropetrovskiy gosudarstvennyy universitet (Dn
(Dnepropetrovsk State University)

SUBMITTED: May 21, 1962

Card 1/1

30???

1 ??71 (also 1162)
15.2450

S/048/61/025/011/??/031
B117/B102

AUTHORS: Kolomoytsev, F. I., Kodzhespirov, F. F., Yakunin, A. Ya., and Sinyakov, Ye. V.

TITLE: Some possibilities of improving the quality of superhigh-frequency ferrites

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 25, no. 11, 1961, 1422-1426

TEXT: Ferrites with the composition $MgAl_{0.3}Fe_{1.7}O_4$ (Ref. 1: Smolenskiy G. A., Gurevich, A. G., Poluprovodniki v nauke i tekhnike (Semiconductors in science and engineering), v. II. Izd. AN SSSR, 1958; Refs. 2 and 3: see below) were examined. These ferrites were prepared from the oxides by the usual technique, namely, at different temperatures of preliminary annealing T_{pre} and of final annealing T_{fin}. Experiments showed that the magnetization of a single formula unit of ferrite changes in the range of $0.78 \leqslant m \leqslant 1.30$ when the sintering technique is varied. An increase of the annealing temperature and slow cooling result in lower values of the

X

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30082
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B117/B102

Some possibilities of ...

saturation magnetization m, and yields a better ordered spinel. At the same time, the ferrite density ϱ increased so much that $m\varrho$ and, consequently, the activity of the specimens increased as well. $m\varrho$ and the phase shift $\Delta\varphi$ are interrelated. A less ordered distribution of metal ions in the lattice was observed when the specimens were chilled. This led to excessively high values of m and $\Delta\varphi$. These conclusions were substantiated by an X-ray determination of the lattice constants. It is possible to reduce the losses by a proper choice of annealing temperatures. The following conditions of heat treatment in the furnaces with constant cooling time τ = 15 hr are suggested for Al-Mg ferrites: T_{pre} = 1100°-1120°C (4-6 hr); T_{fin} = 1200°-1150°C (4-6 hr). Al-Mg ferrites as well as other ferrite types can be improved as to activity and losses by additional heating in a suitable atmosphere. It is finally stated that the quality of ferrites can be improved by separate regulation of their activity and losses. As to Al-Mg ferrites, it is recommended that the sintering temperatures should not be higher than 1200°C. Quicker cooling at adequate temperature and duration of annealing is of decisive importance to an increase of activity. Losses are reduced by annealing in an oxygen-saturated atmosphere or in an oxygen stream. In this case large

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crystallites must be prevented from forming in the polycrystalline system. There are 2 figures, 3 tables, and 9 references: 5 Soviet and 4 non-Soviet. The three references to English-language publications read as follows: Ref. 2: Vitert L. G., Schafer I. P., Hogan C. L., J. Appl. Phys., 25, no. 7 (1954); Ref. 3: Vitert L. G., J. Appl. Phys., 28, no. 3 (1957); Blackman A. B., J. Amer. Cer. Soc., III, 42, no. 3 (1959).

X

Card 3/3

SINYAKOV, Ye.V.; DUDNIK, Ye.F.

Ferroelectric properties of $SrNb_2O_6$ - 0.5 YbFeO. Fiz.tver. tela 4 no.10:2971-2972 O '62. (MIRA 15:12)

1. Dnepropetrovskiy gosudarstvennyy universitet.
(Systems (Chemistry)) (Dielectric constant)

ACCESSION NR: AP4030653 S/0048/64/028/004/0731/0734

AUTHOR: Sinyakov, Ye.V.; Kudzin, A.Yu.

TITLE: Electric conductivity anomaly in barium titanate single crystals annealed at high temperatures [Report, Symposium on Ferromagnetism and Ferroelectricity held in Leningrad 30 May to 5 June 1963]

SOURCE: AN SSSR. Izv. Ser.fiz., v.28, no.4, 1964, 731-734

TOPIC TAGS: barium titanate, electric conductivity, barium titanate electric conductivity, barium titanate reduction, barium titanate oxygen defect , F center migration

ABSTRACT: The electric conductivity of barium titanate single crystals was measured at temperatures from 20 to 250°C, and the effect of high temperature anneal in air and oxygen was investigated. The crystals were prepared from purified materials, and only crystals with no visible defects were employed. The conductivity was measured with an electronic electrometer having a sensitivity of 7×10^{-15} A/mm. Guard electrodes were employed to avoid surface effects. Conductivity measurements on unannealed crystals agreed well with other earlier measurements and showed an activation energy of 2.56 eV at temperatures above 160°C. Crystals were annealed for 5 to 7 hrs.

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ACCESSION NR: AP4030653

at 900°C in air and in oxygen. The anneal had the same effect whether it was conducted in air or in oxygen. The conductivity increased several orders in magnitude, and the activation energy dropped to 1.5 or 1.6 eV and became independent of temperature and applied voltage. The current in the annealed crystals was a nonlinear function of the applied voltage; it sometimes increased as rapidly as the seventh power of the voltage. When the voltage was applied, the current would gradually rise to its final value. The time required for the current to reach its equilibrium value varied from about 10 minutes to over an hour. The rise was more rapid at higher temperatures and voltages. After the applied field was removed, the crystal would gradually resume its initial state of low conductivity. In view of work of V.M.Gurevich and I.S.Rez (Fizika tverdogo tela,2,673,1960), it is concluded from the activation energy that the enhanced conductivity was due to oxygen defects. These would be formed in the surface layer during the anneal and would migrate to the interior of the crystal under the influence of the field. The conclusion that barium titanate can lose oxygen at high temperature even in an oxygen atmosphere is in accord with findings of H.Arend and P.Coufova (Chekhosl.fiz.zh.,No.11,416,1961). The recovery of the state of low conductivity after the field was removed is less easily understood. It is suggested that complex defects were formed, involving F centers and trivalent

Card 2/3

ACCESSION NR: AP4030653

titanium ions. The F centers would migrate to the interior of the crystal under the influence of the field; when the field was removed, the F centers would diffuse to the surface and locate near trivalent titanaium ions. Orig.art.has: 2 formulas and 6 figures.

ASSOCIATION: none

SUBMITTED: 00 DATE ACQ: 30Apr64 ENCL: 00

SUB CODE: EM NR REF SOV: 002 OTHER: 004

Card 3/3

L 57560-65 EWG(j)/EWT(l)/EWT(m)/EPF(c)/EPR/T/EWP(t)/EEC(b)-2/EWP(b)/EWA(c)
Pr-4/Ps-4/Pi-4 IJP(c) JD/GG

ACCESSION NR: AP5016143 UR/0048/65/029/006/1013/1015

AUTHOR: Sinyakov, Ye.V.; Dudnik, Ye.F.; Flerova, S.A.

60
B

TITLE: Electric properties of barium titanate single crystals doped with zinc oxide /Report, 4th All-Union Conference on Ferroelectricity held in Rostov-on-the-Don 12-18 Sept 1964/

SOURCE: AN SSSR.Izvestiya.Ser.fizicheskaya,v.29,no.6,1965, 1013-1015

TOPIC TAGS: ferroelectric crystal, barium titanate, doping, zinc, dielectric constant, phase transition, domain structure

ABSTRACT: The authors have grown $BaTiO_3$ crystals containing up to 2 mole percent ZnO and have examined some of their properties. Zinc was selected as dopant for this investigation because the Zn^{2+} ion differs considerably from the Ba^{2+} ion both in radius and in electron shell structure. The crystals were grown from solution in fused KF with the temperature reduced at the rate of 60 deg/hour. The crystals so obtained were from 0.1 to 0.5 mm thick with hypotenuses from 10 to 20 mm. The addition of ZnO led to a regular decrease of the Curie point

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ACCESSION NR: AP5016143

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and to a distortion of the unit cell. It is concluded that solid solutions were formed in which Ba^{2+} ions were replaced by Zn^{2+} ions. The effective dielectric constant was measured in strong 50 cycle/sec fields. As a function of the measuring field strength the effective dielectric constant went through a maximum, which occurred at approximately 500 V/cm for pure $BaTiO_3$. The field strength at which this maximum occurred increased with increasing ZnO content, and the maximum value of the effective dielectric constant decreased. The ratio of the maximum effective dielectric constant to the dielectric constant measured with weak fields increased from 189 for pure $BaTiO_3$ to 250 for crystals containing 0.2 mole percent ZnO, and then decreased to 156 for crystals containing 2 mole percent ZnO. The coercive field increased linearly with ZnO content and for crystals containing 2 mole percent AnO it was 1.8 kV/cm above the value for pure $BaTiO_3$. The dielectric loss at 1 megacycle/sec was greater in the doped crystals than in the pure ones. The presence of zinc favored the formation of a-domains. This is in agreement with the conclusion of J.Fousek and B.Brezina (Czech.J.Phys.10,511,1960; J.Phys.Soc.Japan 19,830,1964), who showed that internal distortion of the crystal lattice favors an

Card 2/3

L 57560-65

ACCESSION NR: AP5016143

0

a-type domain structure. Orig.art.has: 5 figures and 2 tables.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: SS,EM

NR REF SOV: 004 OTHER: 004

Card 3/3

SINYAKOV, Yu.I., red.; ONOSHKO, N.G., tekhn.red.

[Machinery and instrument manufacture in Leningrad from 1959 to 1965] Mashinostroenie i priborostroenie Leningrada v 1959-1965 gg. Lenizdat, 1958. 14 p. (MIRA 12:6)
(Leningrad--Machinery industry)

LAVRIKOV, Yuriy Aleksandrovich; KARIMOV, Khamza Khusainovich; PERSIANOV, Roman Mikhaylovich; SINYAKOV, Yu.I., red.; ONOSHKO, N.G., tekhn.red.

[Account of the Leningrad Economic Region] Ocherk o Leningradskom ekonomicheskom administrativnom raione. Lenizdat, 1958. 78 p. (MIRA 12:6)

(Leningrad Economic Region)

LYUBCHENKO, Aleksandr Aleksandrovich; SINYAKOV, Yu.I., red.; LEVONEVSKAYA, L.G., tekhn.red.

[Our technical committee] Nasha tekhnicheskaia komissiia. Leningrad, Lenizdat, 1959. 23 p. (MIRA 13:3)

1. Glavnyy inzhener Izhorskogo zavoda (for Lyubchenko).
(Efficiency, Industrial)

BELUKHA, Nikolay Andreyevich; SINYAKOV, Yu.I., red.; LEVONEVSKAYA, L.G., tekhn. red.

[Fulfilling seven-year plan in five years] Semiletku - za piat' let. Leningrad, Lenizdat, 1959. 23 p. (MIRA 15:5)

1. Sekretar' Petrogradskogo rayonnogo komiteta Kommunisticheskoy partii Sovetskogo Soyuza (Belukha).
(Leningrad--Socialist competition)

ZAYTSEV, Vasiliy Stepanovich; SINYAKOV, Yu.I., red.; LEVONEVSKAYA, L.G., tekhn.red.

[On the initiative of Valentina Gaganova] Po pochinu Valentiny Gaganovoi. Leningrad, Lenizdat, 1959. 27 p. (MIRA 13:4)
(Textile industry)

SIDOROV, Mikhail Mikhaylovich; SINYAKOV, Yu.I., red.; TIKHONOVA, I.M., tekhn.red.

[We shall master 1600 types of new equipment] Osvoim 1600 obraztsov novogo oborudovaniia. Leningrad, Lenizdat, 1959. 41 p. (MIRA 13:3)

1. Zaveduyushchiy promyshlennym otdelom Leningradskogo obkoma kommunisticheskoy partii Sovetskogo Soyuza (for Sidorov).
(Leningrad--Industrial equipment--Technological innovations)

SUVOROVA, Lidiya Aleksandrovna; SINYAKOV, Yu.I., red.; TIKHONOVA, I.M., tekhn.red.

[We are the builders of communism] My - stroiteli kommunizma. Leningrad, Lenizdat, 1959. 51 p. (MIRA 13:8)

1. Deputat Verkhovnogo Soveta RSFSR; Pryadil'no-nitochnyy kombinat imeni S.M.Kirova (for Suvorova).
(Leningrad--Textile industry) (Efficiency, Industrial)

KARIMOV, Kh.Kh.; LAVRIKOV, Yu.A.; PERSIANOV, P.M.; SINYAKOV, Yu.I., red.; SMIRNOV, P.S., tekhn.red.

[Economy of Leningrad in the seven-year plan] Ekonomika Leningrada v semiletke. Leningrad, Lenizdat, 1959. 90 p. (MIRA 13:4)

(Leningrad Economic Region--Economic policy)

BARANOV, Aleksandr Alekseyevich; NOSOV, F.V., doktor istor.nauk, red.; SINYAKOV, Yu.I., red.; POL'SKAYA, R.G., tekhn.red.

[Labor productivity is the most important factor for the victory of communism] Proizvoditel'nost' truda - samoe vazhnoe dlia pobedy kommunizma. Pod obshchei red. F.V.Nosova. Leningrad, Lenizdat, 1960. 36 p. (MIRA 14:4)
(Labor productivity)

VERSHININ, Il'ya Kuz'mich, slesar'; SINYAKOV, Yu.I., red.; SHERMUSHENKO, T.A., tekhn.red.

[To live well one must work well] Chtoby khorosho zhit' - nuzhno khorosho trudit'sia. Leningrad, Lenizdat, 1960. 49 p. (MIRA 14:4)

1. Zavod "Elektrik" (for Vershinin).
(Labor and laboring classes)

LATYSHEVA, A.V.; SINYAKOV, Yu.I., red.; LEVONEVSKAYA, L.G., tekhn. red.

[At a new stage; from the work practice of Leningrad trade unions] Na novom etape; iz opyta raboty leningradskikh profsoiuzov. Leningrad, Lenizdat, 1960. 109 p. (MIRA 15:1)

1. Sekretar' Leningradskogo oblastnogo soveta profsoyuzov (for Latysheva).

(Leningrad--Trade unions)

ZURABAYEV, Nikolay Vladimirovich, kand. tekhn. nauk, dotsent; SINYAKOV, Yu.I., red.; TIKHONOVA, I.M., tekhn. red.

[From Volkhovstroi to power giants] Ot Volkhovstroia k gigantam energetiki. Leningrad, Lenizdat, 1960. 145 p. (MIRA 14:8)

1. Gidrotekhnicheskiy fakul'tet Leningradskogo politekhnicheskogo instituta imeni M.I.Kalinina.
(Electric power plants)

OVCHINNIKOVA, Irina Ignat'yevna; SINYAKOV, Yu.I., red.; SHERMUSHENKO, T.A., tekhn.red.

[Soviet women as active builders of communism] Sovetskie zhenshchiny - aktivnye stroiteli kommunizma. Leningrad, Lenizdat, 1961. 79 p. (MIRA 14:4)
(Women--Employment)

NIKITIN, M.I.; KATS, Ye.L.; SINYAKOV, Yu.I., red.; ONOSHKO, N.G., tekhn. red.

[Under their country's flag] Pod flagom Rodiny. Leningrad, Lenizdat, 1961. 158 p. (MIRA 15:2)

1. Zamestitel' redaktora gazety "Sovetskaya Baltika" (for Kats).
2. Chlen partiynogo komiteta Baltiyskogo gosudarstvennogo morskogo parokhodstva (for Nikitin).
(Communist Party of the Soviet Union) (Merchant seamen)

SINYAKOV, Yu.I.; GORBANEV, A.I.; POVAROV, Yu.M.; KESSLER, Yu.M.

Density of N-methylformamide. Izv. AN SSSR. Otd.khim.nauk no.8:1514-1515 Ag '61. (MIRA 14:8)

1. Institut elektrokhimii AN SSSR.
(Formamide)

AKHLIBINSKIY, Boris Vladimirovich; KHRALENKO, Nikolay Ivanovich;
SINYAKOV, Yu.I., red.; PRESNOVA, V.A., tekhn. red.

[... Plus chemicalization]... Plius khimizatsiia. Leningrad, Lenizdat, 1964. 77 p. (MIRA 17:1)
(Chemistry, Technical--Research)
(Agricultural chemistry)

KRUGLIKOV, S.S.; SINYAKOV, Yu.I.; KUDRYAVTSEV, N.T.

Diffusion control of thiourea consumption in a sulfate electrolyte for copper plating. Elektrokhimiia 2 no.1:100-103 Ja '66. (MIRA 19:1)

1. Moskovskiy khimiko-tekhnologicheskiy institut imeni D.I. Mendeleyeva. Submitted March 30, 1965.

SINYAKOVA L. A.

TSUPAK, Valerian Fedorovich, kand.sel'skokhozyaystvennykh nauk; KULEVA, Iraida Fedorovna, kand.sel'skokhozyaystvennykh nauk; SINYAKOVA, Lidiya Andreyevna, kand.biol.nauk; VOROB'YEV, F.I., red.; CHUMAYEVA, Z.V., tekhn.red.

[Practical laboratory experiments in plant culture] Laboratorno-prakticheskie zaniatiia po rastenievodstvu. Moskva, Gos. izd-vo sel'khoz. lit-ry, 1957. 255 p. (MIRA 11:4)
(Plants, Cultivated)

YAKUBTSINER, M.M.; ZHUKOVSKIY, P.M., akademik, red.; SINYAKOVA, L.A., red.; CHUMAYEVA, Z.V., tekhn.red.

[Wheat in the U.S.S.R.] Pshenitsa v SSSR. Moskva, Gos.izd-vo sel'khoz. lit-ry, 1957. 632 p. (MIRA 11:3)
(Wheat)

B-5

USSR / General Biology. Genetics.

Abs Jour : Ref Zhur - Biol., No 12, 1958, No 52445

Author : ~~Sinyakova, L. A.~~
Inst : Not given
Title : Some Changes in Characteristics of Tomato Grafts.

Orig Pub : Tr. po prikl. botanike, genet. i selektsii, 1957, 30, No. 3, 278-287

Abstract : Tests of single, and 2- and 3-fold grafts of tomatoes on potatoes, egg plants, pepper and black nightshade are described. The influence of various wildings on the biochemical characteristics of the grafted plants and their seed heredity were elucidated: on sugar and Vitamin C content, degree of acidity, content of dry matter, catalase activity. At the same time, data are given as to change in length of vegetative period and size, form and clusters of the fruit. -- Ye. N. Volotov.

Card 1/1

NOVIKOV, Vladimir Aleksandrovich, prof.; SINYAKOVA, L.A., red.; BARANOVA, L.G., tekhn. red.

[Plant physiology] Fiziologiia rastenii. Leningrad, Izd-vo sel'khoz. lit-ry, zhurnalov i plakatov, 1961. 415 p. (MIRA 15:2)

(Plant physiology)

SIDOROV, Fedor Fedorovich; SINYAKOVA, L.A., red.; BARANOVA, L.G., tekhn. red.

[Growing ear corn for silage in the northwestern zone]Vyrashchivanie kukuruzy s pochatkami na silos v severo-zapadnoi zone. Leningrad, Sel'khozizdat, 1962. 70 p. (MIRA 15:11)
(Russia, Northwestern--Corn (Maize))

SINYAKOV, V.I.; SINYAKOVA, N.M.

Monticellitite skarns in Gornaya Shoriya. Zap.Vses.min.ob-va 90 no.6:720-727 '61. (MIRA 15:2)

1. Sibirskiy metallurgicheskiy institut, Novokuznetsk.
(Gornaya Shoriya--Skarns)

CA

SUVOROVA, S.I.

1

Methods for the determination of minimum concentrations. Determination of mercury. S. I. Suvorova. *J. Gen. Chem.* (U. S. S. R.) 4, 1001 (1934). By the strychnine nephelometric method as little as 2 γ Hg can be detected. To the test tube with mark at 2 cc. add a measured vol. of the soln. to be analyzed, 0.5 cc. of 0.5% KI, 0.1 cc. of satd. cold soln. of strychnine nitrate or sulfate and dil. to the mark. Compare the white cloudiness produced with that obtained with standards. V. D. Karpenko

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

3RD AND 4TH ORDERS

PROCESSES AND PROPERTIES INDEX

Ca

7

Determination of low concentrations. XIII. Determination of benzene. S. I. Sinyakova. *J. Applied Chem.* (U.S.S.R.) 9, 2109-14 (in French 2115) (1936); cf. *C. A.* 30, 7490[4].—Known methods were examd. Conversion of C_6H_6 into m-$C_6H_4(NO_2)_2$ permits colorimetric detn. by treatment with acetone in the presence of NaOH soln.; as little as 0.007 mg. of m-$C_6H_4(NO_2)_2$ can be detd. in 3 cc. of a soln. The standard must be prepd. by nitration of a known amt. of C_6H_6 under the same conditions as those of the unknown. Eighteen references.

A. A. Podgorny

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX

A-1

Determination of small concentrations. XIV. Determination of copper. S. I. Siniakova (J. Appl. Chem. Russ., 1937, 10, 2109—2117).—0·5 ml. of saturated aq. NH_4Cl and 5 drops of 3% $K_4Fe(CN)_6$ are added to 10 ml. of solution, containing 0·01—0·1 mg. Cu, and $\not>$0·05 mg. Zn or 0·2 mg. Pb, followed by H_2O to 15 ml., and the coloration (stable during 30 min.) is compared with that given by standard solutions, or is determined photocolorimetrically. Tananaev and Ivanova's method (A., 1936, 695) is applicable to the approx. determination of 0·03—0·4 mg. Cu in 1 ml. of solution. Hahn and Leimbach's method (A., 1922, ii, 870) serves for the determination of $\not<$0·05 mg. Cu. R. T.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

The boron content of soils in the U. S. S. R. K. N. Sinyakova. *Trav. lab. biogeochim. acad. sci. U. R. S. S.* 5, 151 Sim French, 158 9(1939). —Top soils from regions along longitude 40° were analyzed for their total and water-sol. B contents. A 5-g. sample of soil was fused with 15–20 g. of Na_2CO_3, dissolved in 10–20 cc. water and evapd. The dry residue was placed in a distn. flask and 5 cc. concd. H_2SO_4 added. The water was distd. off until the appearance of SO_3 fumes. On cooling, 30 cc. MeOH was added and the Me borate distd. into a soln. of NaOH. This was repeated with 10 cc. of MeOH, the distillates were combined, the MeOH was distd. off, the remainder neutralized (HCl) in the presence of methyl red, and the B titrated with $Ba(OH)_2$ according to Foote's method (cf. C. A. 20, 1366). For detn. of water-sol. B 250 g. of soil was boiled in 500 cc. of water for 30 min. On filtration the residue was washed until there was no reaction for Cl. To the filtrate 1 cc. of N NaOH was added, and evapd. down to 2–3 cc. This soln. was worked up with MeOH, as above, and B titrated. Amts. below 0.02 mg. B were not detd. In 15 samples 2×10^{-4} – 1.6×10^{-3}% total B and 1.9×10^{-5} – 1.1×10^{-4}% water-sol. B were found. In general, soils in southern regions were richer in B than those in the northern, and in the soil of tundras no B could be found. **The boron content of various soil strata and of plants.** S. G. Tseitlin. *Ibid.* 161–Sim French, 168 9(). Total and water-sol. B were detd. as in the above abstract. The B content of different soils varies from $n \times 10^{-4}$ to $n \times 10^{-3}$% in the upper strata and $n \times 10^{-4}$ to $n \times 10^{-3}$% in the lower ones. In some soils the amt. of B increases with depth, especially in "gray soils." Cereal grasses contain less B than many grass dicotyledons. The accumulation of B in plants generally depends upon the species and not on the kind of soil they grow on. T. Laanes

METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

Ca

7

Polarographic determination of indium and cadmium (in zinc blende). S. I. Sinyakova. *Compt. rend. acad. sci. U. R. S. S.* 29, 376-9(1940)(in English); cf. Kraus, *C. A.* 33, 3716[9].—The half wave potential of In is −0.63 v. against the *N* calomel electrode. The min. concn. for polarographic analysis is 0.001 mg. per ml. of soln. Zinc blende (0.2-0.5 g.) is dissolved in HCl, HNO_3, or H_2SO_4. The soln. is evapd., and the residue taken up with HCl and dild. to vol. An aliquot part is polarographed in 0.1 *N* KCl, HCl, and the sum of the In and Cd concns. calcd. from the height of their coinciding steps on the current-voltage curve. A second aliquot is polarographed in *N* NH_4OH, 0.002 *N* NH_4Cl, contg. 1 drop of 1% agar-agar and a Na_2SO_3 crystal. The In is pptd. and the concn. of Cd is calcd. from the height of its step. In is found as the difference. The method is applicable if the ratio Cd/In is less than 5.

Gerald Reed

Biogeochem. Lab., Inst. Geochem. + Analyt. Chem. im. V. I. Vernadskiy, AS USSR

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

SINYAKOVA, S.I.

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

***Polarographic Analyses Using Solid Anodes.** S. I. Sinyakova (*Trudy Vsesoyuz. Konf. Anal. Khim.*, 1943, 2, 529–550).—[In Russian.] An investigation was made of the possibility of replacing Hg anodes by solid or amalgamated Ag, Au, Pd, Ni, W, or Cu anodes. Wires 1–1·5 mm. in dia. and 10–15 cm. long were used as anodes, while the cathode was of the usual mercury design. It was shown that Ag can replace the Hg anode successfully, but that equally satisfactory results were obtained with Au, Pd, and the other metals only when they were used in the amalgamated state.—V. K.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION